

# Claims

- [c1] 1. A thermal spraying device comprising:  
a flame-generating means (1,2) for generating a flame  
and an injection means (3) for injecting a powder into  
the generated flame;  
said flame-generating means (1,2) comprising an end  
piece (1) out of which the flame is directed towards a  
substrate to be subjected to spraying; and  
said powder-injection means (3) comprises a frame ele-  
ment (6) that projects in the flame ejection direction  
from the end piece (1) and the frame element (6) at least  
partly surrounds a flame zone extending from the end  
piece (1).
- [c2] 2. The thermal spraying device as recited in claim 1,  
wherein the frame element (6) covers at least 90 degrees  
(180 degrees) of a circumference around the flame zone  
extending from the end piece (1).
- [c3] 3. The thermal spraying device as recited in claim 1,  
wherein the frame element (6) covers at least 180 de-  
grees of a circumference around the flame zone extend-  
ing from the end piece (1).

- [c4] 4. The thermal spraying device as recited in claim 1, wherein the frame element (6) covers at least 270 degrees of a circumference around the flame zone extending from the end piece (1).
- [c5] 5. The thermal spraying device as recited in claim 1, wherein the frame element (6) has an inner periphery having a cross-section shape corresponds to the cross-section shape of the inner periphery of the end piece (1).
- [c6] 6. The thermal spraying device as recited in claim 1, wherein the frame element (6) defines a ring-shaped element.
- [c7] 7. The thermal spraying device as recited in claim 1, wherein at least a part of the frame element (6) that projects beyond the end piece (1) in the flame ejection direction comprises greater than ten radially oriented open through holes (9).
- [c8] 8. The thermal spraying device as recited in claim 1, wherein at least a part of the frame element (6) that projects beyond the end piece (1) in the flame ejection direction comprises at least one radially oriented open through hole (9).
- [c9] 9. The thermal spraying device as recited in claim 1, wherein at least a part of the frame element (6) that

projects beyond the end piece (1) in the flame ejection direction comprises a plurality of radially oriented open through holes (9).

[c10] 10. The thermal spraying device as recited in claim 9, wherein the plurality of radially oriented open through holes (9) are evenly distributed around a periphery of the frame element (6).

[c11] 11. The thermal spraying device as recited in claim 9, wherein the end piece (1) has an inner diameter  $d$  and the frame element (6) has a projection distance  $p$ , and  $0.5d < p < 6d$ .

[c12] 12. The thermal spraying device as recited in claim 9, wherein the end piece (1) has an inner diameter  $d$  and the frame element (6) has a projection distance  $p$ , and  $0.5d < p < 2d$ .

[c13] 13. The thermal spraying device as recited in claim 1, wherein the end piece (1) has an inner diameter  $d$  and a projecting part of the frame element (6) has a corresponding inner diameter  $D$  in which is at least as great as  $d$ .

[c14] 14. The thermal spraying device as recited in claim 1, wherein the end piece (1) has an inner diameter  $d$  and a projecting part of the frame element (6) has a corre-

sponding inner diameter D approximately 1.2 times as great as d.

- [c15] 15. The thermal spraying device as recited in claim 1, wherein a plurality of powder injection ports (5) are distributed around the inner periphery of the frame element (6) and are oriented to direct injected powder towards a central flame.
- [c16] 16. The thermal spraying device as recited in claim 15, wherein the plurality of powder injection ports (5) are evenly distributed around the inner periphery of the frame element (6).
- [c17] 17. The thermal spraying device as recited in claim 15, wherein each of the plurality of powder injection ports (5) further comprises a nozzle inserted in a radial opening through the frame element, and at least one of the open through holes (9) is adapted for accommodating a nozzle (5) therein.
- [c18] 18. The thermal spraying device as recited in claim 1, wherein the frame element (6) is detachably attached to the end piece (1).
- [c19] 19. The thermal spraying device as recited in claim 1, wherein the flame generated by the flame-generating means is a plasma jet.

